



Mathematics: Year 1

I. NUMBERS AND THE NUMBER SYSTEM

A. WHOLE NUMBERS

- Read and write numbers to at least 30 in figures.
- Count reliably at least 30 objects.
- Count on or back in ones, twos, fives or tens.
- Recognise the place value of each digit in a number to at least 30.
- Compare and order numbers to at least 30, using the related vocabulary and the equals (=) sign.
- Use knowledge of place value to position numbers to at least 30 on a number line.
- Identify ordinal numbers, first (1st) to tenth (10th).
- Within the range 0 – 30, identify the number that is 1 more or 1 less than a given number.
- Estimate a number of objects up to about 30 objects.

B. FRACTIONS

- Identify $\frac{1}{2}$ as one of two equal parts of a region or object.
- Find $\frac{1}{2}$ of a set of objects.

II. NUMBER OPERATIONS AND CALCULATIONS

A. ADDITION AND SUBTRACTION

- Understand addition as counting on and combining two groups of objects, using appropriate vocabulary.
- Understand subtraction as 'take away' and 'difference', using appropriate vocabulary.
- Use the +, – and = signs to record calculations.
- Recall pairs of numbers with a total of 10.
- Recall all addition and subtraction facts for each number to at least 5.
- Begin to recall all addition and subtraction facts for each number to at least 10.
- Use known number facts and place value to add or subtract mentally a pair of one-digit numbers, e.g. $5 + 7$, $9 - 4$.
- Use informal written methods to add or subtract.
 - Add or subtract a one-digit number to or from a two-digit number, e.g. $14 + 7$, $18 - 6$.
 - Add a multiple of 10 to a one-digit or two-digit number, e.g. $60 + 4$, $60 + 24$.
 - Subtract a multiple of 10 from a two-digit number, e.g. $58 - 30$.

B. MULTIPLICATION AND DIVISION

- Combine groups of the same size, using practical activities.
- Arrange objects into equal groups, using practical activities.
- Begin to use the vocabulary of multiplication and division.
- Identify doubles of all numbers to at least 10.

III. MEASUREMENT

A. LENGTH, MASS, CAPACITY AND TEMPERATURE

- Identify familiar instruments of measurement, such as a ruler, scale and thermometer, and be able to describe their uses.
- Compare lengths, masses, capacities and temperatures using appropriate vocabulary.
- Estimate, then measure, while choosing and using suitable, uniform non-standard or standard units and measuring equipment, e.g. straws, interlocking cubes, marbles, yoghurt pots, metre stick, litre jug.
- Begin to use a ruler to measure lengths in centimetres.

B. TIME

- Use vocabulary related to time.
- Sequence familiar events in time.
- Compare duration of events.
- Know the days of the week and the months of the year.
- Read the time to the hour and half hour on an analogue clock.

C. MONEY

- Identify and use the pound (£) and pence (p) signs and the 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2 coins.
- Find totals and give change.
- Write simple money amounts, e.g. 30p, £4.

IV. GEOMETRY

A. 2-D AND 3-D SHAPES

- Visualise and name common 2-D shapes, including a circle, triangle, square and rectangle.
- Visualise and name common 3-D solids, including a sphere, cylinder, cone, square-based pyramid, cube and cuboid.
- Use everyday language to describe features of common 2-D shapes, including the number of sides and corners.
- Use everyday language to describe features of common 3-D solids, including the shapes of faces and number of faces and corners.
- Recognise common shapes and solids in the environment.
- Use shapes and solids to make patterns, designs, pictures and models.

B. POSITION, DIRECTION AND MOVEMENT

- Use everyday language to describe position, direction and movement.

V. DATA

- Establish concepts of likeness and difference by sorting and classifying objects according to various criteria: size, shape, colour, amount, function, etc.
- Define a set by the common property of its elements.
- In a collection of objects that includes a given set and an item that does not belong, indicate which item does not belong.
- Interpret and construct simple pictograms.

VI. PROBLEM SOLVING AND REASONING

- Recognise and continue simple patterns involving numbers or shapes.
- Describe simple relationships involving numbers or shapes.
- Solve simple mathematical problems and puzzles involving numbers or shapes.
- Solve practical problems involving addition, subtraction, multiplication or division in the context of numbers or measurements, including money.



Mathematics: Year 2

I. NUMBERS AND THE NUMBER SYSTEM

A. WHOLE NUMBERS

- Read and write numbers to at least 100 in figures and words.
- Count reliably at least 100 objects by grouping them, e.g. in tens, fives or twos.
- Count on or back in ones, twos, fives or tens from any given number.
- Recognise odd and even numbers to at least 100.
- Recognise the place value of each digit in any two-digit number, and partition two-digit numbers into multiples of 10 and 1.
- Compare numbers to at least 100 using the $<$, $>$, and $=$ signs.
- Order a set of numbers to at least 100 and position numbers on a number line or grid.
- Identify ordinal numbers, first (1st) to hundredth (100th).
- Within the range 0 – 100, identify the number that is 1 or 10 more or less than a given number.
- Estimate a number of objects, e.g. up to about 100 objects.
- Round two-digit numbers to the nearest 10.

B. FRACTIONS

- Find $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{4}$ of shapes and sets of objects.

II. NUMBER OPERATIONS AND CALCULATIONS

A. ADDITION AND SUBTRACTION

- Recognise that addition can be done in any order.
- Understand and use the inverse relationship between addition and subtraction.
- Understand that more than two numbers can be added.
- Recall pairs of numbers that total 20.
- Recall all addition and subtraction facts for each number to at least 10.
- Begin to recall all addition and subtraction facts for each number to 20.
- Know addition and subtraction 'fact families' to 10, e.g. $2 + 3 = 5$, $3 + 2 = 5$, $5 - 3 = 2$, $5 - 2 = 3$.
- Use known number facts and place value to mentally:
 - add or subtract a one-digit number to or from a two-digit number, e.g. $14 + 7$, $18 - 6$;
 - add a multiple of 10 to a one-digit or two-digit number, e.g. $60 + 4$, $60 + 24$;
 - subtract a multiple of 10 from a two-digit number, e.g. $58 - 30$.
- Use informal written methods to add or subtract pairs of two-digit numbers, e.g. $35 + 68$, $74 - 46$.

B. MULTIPLICATION AND DIVISION

- Understand multiplication as repeated addition and arrays, using appropriate vocabulary.
- Understand division as sharing and grouping (repeated subtraction), using appropriate vocabulary.
- Recall multiplication facts for the 2, 5 and 10 times-tables, and the corresponding division facts.
- Recognise multiples of 2, 5 and 10.
- Understand and use the inverse relationship between doubling and halving, and multiplication and division.

C. MIXED OPERATIONS

- Use the +, −, ×, ÷ and = signs to record calculations, including symbols such as □, ○ or △ to stand for an unknown number, e.g. $5 + \bigcirc = 7$, $\square \times 2 = 12$.
- Use knowledge of number facts, operations and inverse relationships to estimate and check calculations.

III. MEASUREMENT

A. LENGTH, MASS, CAPACITY AND TEMPERATURE

- Choose and use appropriate instruments to measure lengths, masses, capacities and temperatures.
- Estimate, compare and measure lengths, masses, capacities and temperatures using standard units (metre, centimetre, kilogram, litre, degrees Celsius).
- Read relevant scales to the nearest numbered division and interpret the divisions between them.
- Use a ruler to measure and draw lengths to the nearest centimetre.

B. TIME

- Use units of time and know the relationship between them, e.g. second, minute, hour, day, week, month, year.
- Compare duration of events, including those that cross the hour.
- Read the time to the quarter hour on an analogue clock and 12-hour digital clock and understand the notation 5:45.

C. MONEY

- Identify all coins and notes and begin to use £.p notation.
- Find totals, give change and work out which coins to use.
- Combine coins and notes to make a given value and show different combinations of coins and notes that equal the same value.

IV. GEOMETRY

A. 2-D AND 3-D SHAPES

- Visualise and name common 2-D shapes, including circle, triangle, square, rectangle, pentagon, hexagon and octagon.
- Visualise and name common 3-D solids, including cube, cuboid, sphere, cylinder, cone, square-based pyramid and tetrahedron.
- Use everyday language to describe features of common 2-D shapes, including the number of sides, number of right angles and symmetry.
- Use everyday language to describe features of common 3-D solids, including the shapes of faces, number of faces, edges and vertices.
- Compare and sort common shapes and solids, including those in different orientations and in the environment.
- Use shapes and solids to make patterns, pictures and models, including congruent shapes and designs.

B. POSITION, DIRECTION AND MOVEMENT

- Use appropriate mathematical language to describe position, direction and movement.
- Recognise and make whole, half and quarter turns to the left or right and clockwise or anti-clockwise.
- Know that a right angle is a measure of a quarter turn and recognise right angles in rectangles.

C. SYMMETRY

- Begin to recognise reflective symmetry.

V. DATA

- Collect, process, represent, interpret and discuss data in simple ways, such as in a list, table, diagram, pictogram or block graph.

VI. PROBLEM SOLVING AND REASONING

- Recognise and continue patterns involving numbers or shapes.
- Describe relationships involving numbers or shapes.
- Solve mathematical problems and puzzles involving numbers or shapes.
- Solve problems involving addition, subtraction, multiplication or division in the context of numbers or measurements, including money.



Mathematics: Year 3

I. NUMBERS AND THE NUMBER SYSTEM

A. WHOLE NUMBERS

- Read and write numbers to at least 1000 in figures and words.
- Count on or back in single-digit steps or multiples of 10 from any given number.
- Count on or back in steps of 10, 50 or 100 from any given number.
- Recognise the place value of each digit in any three-digit number, and partition three-digit numbers into multiples of 100, 10 and 1.
- Compare numbers to at least 1000 using the $<$, $>$, and $=$ signs.
- Order a set of numbers to at least 1000.
- Round two-digit or three-digit numbers to the nearest 10 or 100.

B. FRACTIONS

- Recognise unit fractions such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$ and $\frac{1}{10}$.
- Use diagrams to compare fractions and establish equivalents.
- Begin to recognise simple fractions that are several parts of a whole, e.g. $\frac{2}{3}$, $\frac{3}{4}$ or $\frac{7}{10}$, interpreting the denominator as the parts of a whole and the numerator as the number of parts.
- Identify pairs of fractions that total 1.
- Find unit fractions of shapes, numbers or quantities, e.g. $\frac{1}{5}$ of 20.

II. NUMBER OPERATIONS AND CALCULATIONS

A. ADDITION AND SUBTRACTION

- Recall sums and differences of multiples of 10.
- Recall all addition and subtraction facts for each number to 20.
- Know addition and subtraction 'fact families' to 20, e.g. $8 + 6 = 14$, $6 + 8 = 14$, $14 - 8 = 6$, $14 - 6 = 8$.
- Use known number facts and place value to mentally:
 - add or subtract a one-digit number to or from a two-digit number, e.g. $63 + 7$, $47 - 6$;
 - add a multiple of 10 or 100 to a one-, two- or three-digit number, e.g. $50 + 6$, $400 + 347$;
 - subtract a multiple of 10 from a two-digit or three-digit number, e.g. $428 - 80$;
 - subtract a multiple of 100 from a three-digit number, e.g. $639 - 500$;
 - add or subtract pairs of two-digit numbers, e.g. $35 + 68$, $74 - 46$.
- Use written methods to:
 - add or subtract a two-digit number to or from a three-digit number, e.g. $647 + 36$, $354 - 78$;
 - add or subtract pairs of three-digit numbers, e.g. $273 + 436$, $364 - 189$.

B. MULTIPLICATION AND DIVISION

- Understand and use the principles (but not the names) of the commutative, associative and distributive laws as they apply to multiplication:
 - example of commutative law: $6 \times 15 = 15 \times 6$
 - example of associative law: $6 \times 15 = 6 \times (5 \times 3) = (6 \times 5) \times 3 = 30 \times 3 = 90$
 - example of distributive law: $8 \times 17 = 8 \times (10 + 7) = (8 \times 10) + (8 \times 7) = 80 + 56 = 136$
- Recall multiplication facts for the 2, 3, 4, 5, 8 and 10 times-tables, and the corresponding division facts.
- Recognise multiples of 2, 5 or 10 up to 1000.

- Multiply one-digit and two-digit numbers by 0, 1, 10 or 100, and understand the effect.
- Solve simple division calculations involving remainders, rounding up or down depending on the context.
- Use informal written methods to multiply or divide a two-digit number by a one-digit number, e.g. 24×3 , $37 \div 5$.

C. MIXED OPERATIONS

- Use the +, −, ×, ÷ and = signs to record calculations, including symbols such as □, ○ or △ to stand for an unknown number, e.g. $15 + \square = 47$, $28 \div \bigcirc = 7$.
- Use knowledge of number operations and inverse relationships to estimate and check calculations.

III. MEASUREMENT

A. LENGTH, MASS, CAPACITY AND TEMPERATURE

- Recognise and use abbreviations for metric units of measure: km, m, cm, kg, g, l, ml, °C.
- Estimate, measure and record lengths, masses, capacities and temperatures using standard units (km, m, cm, kg, g, l, ml, °C).
- Know the relationship between kilometres and metres, metres and centimetres, kilograms and grams, litres and millilitres.
- Read, to the nearest division and half-division, scales that are numbered or partially numbered.

B. TIME

- Use a calendar to identify and record the date, day of the week, month and year.
- Compare duration of events and calculate time intervals.
- Read the time to 5 minutes on an analogue clock and 12-hour digital clock and understand the notation 8:25.
- Understand noon and midnight and distinguish time as am or pm.

C. MONEY

- Recognise relative values of all coins and notes.
- Begin to add and subtract amounts of money to find totals and give change, using £.p notation where appropriate.

IV. GEOMETRY

A. 2-D AND 3-D SHAPES

- Identify, visualise, describe, classify, draw and make 2-D shapes and 3-D solids.

B. POSITION, DIRECTION AND MOVEMENT

- Read and write the vocabulary of position, direction and movement.
- Identify lines as horizontal, vertical, diagonal, perpendicular and parallel.
- Describe and find the position of a square on a grid of squares with the rows and columns labelled.
- Recognise and use the four compass directions. [Cross-curricular connection with Year 1 Geography]
- Identify right angles in 2-D shapes and the environment.
- Recognise whether an angle is greater or smaller than a right angle.
- Recognise that a straight line is equivalent to two right angles.
- Use a set-square to draw right angles.

C. SYMMETRY

- Identify and draw lines of symmetry in simple shapes.
- Recognise shapes with no lines of symmetry.

- Draw the reflection of a shape or pattern in a mirror line along one side.

V. DATA

- Collect, process, represent, interpret and discuss data in a tally chart, frequency table, pictogram or bar chart.
- Read, interpret and represent data:
 - where symbols represent more than one unit, e.g. 2 or 5;
 - where scales have intervals of differing step size, e.g. axis labelled in 2s or 5s.
- Use Venn and Carroll diagrams to sort objects and data.

VI. PROBLEM SOLVING AND REASONING

- Identify and describe numerical and symbolic patterns and relationships.
- Solve mathematical problems and puzzles involving numbers or shapes.
- Solve one-step and two-step problems involving addition, subtraction, multiplication and division in the context of numbers or measurements, including money.



Mathematics: Year 4

I. NUMBERS AND THE NUMBER SYSTEM

A. WHOLE NUMBERS

- Read and write numbers to at least 10 000 in figures and words.
- Recognise and extend number sequences formed by counting on or back from any number in steps of constant size.
- Identify Roman numerals from 1 to 20 (I - XX).
- Recognise odd and even numbers to at least 1000.
- Recognise the place value of each digit in any four-digit number, and partition four-digit numbers into multiples of 1000, 100, 10 and 1.
- Compare numbers to at least 10 000 using the $<$, $>$, and $=$ signs.
- Order a set of numbers to at least 10 000.
- Round numbers to at least 10 000 to the nearest 10, 100 or 1000.
- Understand what negative numbers are in relation to familiar uses (such as temperatures below zero).
- Position positive and negative numbers on a number line.

B. FRACTIONS

- Recognise unit fractions to $\frac{1}{10}$ and fractions whose denominator is 10 or 100.
- Compare fractions with like denominators, using the signs $<$, $>$, and $=$.
- Interpret mixed numbers, e.g. $2\frac{1}{2}$.
- Recognise the equivalence of simple fractions, e.g. $\frac{1}{2} = \frac{3}{6}$.
- Find fractions of shapes, numbers or quantities, e.g. $\frac{1}{3}$ of 12, $\frac{2}{3}$ of 18.

C. DECIMALS

- Understand decimal notation and place value for tenths and hundredths, and use it in context.
- Compare and order decimals, and position decimals on a number line.
- Recognise the equivalence between the decimal and fraction forms of one half, quarters, tenths and hundredths.

II. NUMBER OPERATIONS AND CALCULATIONS

A. ADDITION AND SUBTRACTION

- Understand and use the principles (but not the names) of the commutative and associative laws as they apply to addition.
- Consolidate recall of all addition and subtraction facts for each number to 20.
- Add more than two one-digit or two-digit numbers, e.g. $13 + 8 + 22$
- Use known number facts and place value to mentally:
 - derive sums and differences of multiples of 10, 100 and 1000, e.g. $40 + 80$, $300 + 500$
 - add or subtract pairs of two-digit numbers, e.g. $35 + 68$, $74 - 46$
- Use written methods to:
 - add or subtract pairs of three-digit or four-digit numbers, e.g. $1982 + 726$, $2846 + 1427$, $746 - 317$, $4298 - 2784$
 - add more than two numbers, e.g. $376 + 716 + 123$
 - add or subtract calculations involving money, e.g. $£5.58 + £7.84$, $£9.32 - £4.77$

B. MULTIPLICATION AND DIVISION

- Use the principles (but not the names) of the commutative, associative and distributive laws as they apply to multiplication:
 - example of commutative law: $8 \times 24 = 24 \times 8$
 - example of associative law: $8 \times 24 = 8 \times (6 \times 4) = (8 \times 6) \times 4 = 48 \times 4 = 192$
 - example of distributive law: $9 \times 26 = 9 \times (20 + 6) = (9 \times 20) + (9 \times 6) = 180 + 54 = 234$
- Recall multiplication facts up to 10×10 and the corresponding division facts.
- Recognise multiples of numbers to 10 up to the tenth multiple.
- Recall doubles of all two-digit numbers, multiples of 10 and 100, and the corresponding halves.
- Multiply and divide whole numbers to 1000 by 0, 1, 10 or 100, and understand the effect.
- Use written methods to:
 - multiply a two-digit or three-digit number by a one-digit number, e.g. 472×6
 - divide a two-digit or three-digit number by a one-digit number, including division with remainders, rounding up or down depending on the context, e.g. $263 \div 8$

C. MIXED OPERATIONS

- Use knowledge of rounding, number operations and inverse relationships to estimate and check calculations.

III. MEASUREMENT**A. LENGTH, MASS, CAPACITY AND TEMPERATURE**

- Estimate, measure and record lengths, masses, capacities and temperatures using standard units (km, m, cm, mm, kg, g, l, ml, °C).
- Convert between different units of measure, e.g. km to m, m to cm, cm to mm, kg to g, l to ml or vice versa.
- Begin to use decimal notation to record and convert measurements, e.g. $2.3 \text{ kg} = 2300 \text{ g}$, or vice versa.
- Read and interpret intervals and divisions on partially numbered scales.
- Use a ruler to measure and draw lengths to the nearest millimetre.

B. TIME

- Read a simple timetable.
- Calculate time intervals from clocks, calendars and simple timetables.
- Read the time to the nearest minute on an analogue clock and 12-hour digital clock.
- Use am and pm and 12-hour clock notation, e.g. 5:24.

C. MONEY

- Add and subtract amounts of money to find totals and give change, using £.p notation.

D. PERIMETER AND AREA

- Measure and calculate the perimeter of a rectilinear shape.
- Measure and calculate the area of rectangles and related compound shapes using counting methods and the standard unit cm^2 .

IV. GEOMETRY

A. 2-D AND 3-D SHAPES

- Draw polygons and classify them using criteria such as the number of right angles, whether or not they are regular, and their symmetrical properties.
- Visualise 3-D solids and objects from 2-D drawings.

B. POSITION, DIRECTION AND MOVEMENT

- Read and plot coordinates in the first quadrant.
- Recognise and use the eight compass directions. [Cross-curricular connection with Geography: Year 4]
- Know that angles are measured in degrees and that:
 - one whole turn is 360° (four right angles);
 - a half turn is 180° (two right angles or a straight line);
 - a quarter turn is 90° (or one right angle);
 - half a right angle is 45° .
- Compare and order angles less than 180° .

C. SYMMETRY

- Draw the reflection of a shape or pattern in a mirror line parallel to one side, where all sides of the shape or pattern are parallel or perpendicular to the mirror line.

V. DATA

- Collect, process, represent, interpret and discuss data in a tally chart, frequency table, pictogram or bar chart.
- Read, interpret and represent data:
 - where symbols represent more than one unit, e.g. 2, 5, 10 or 20;
 - where scales have intervals of differing step size, e.g. axis labelled in 2s, 5s, 10s or 20s.

VI. PROBLEM SOLVING AND REASONING

- Identify, describe and use numerical and symbolic patterns and relationships.
- Solve mathematical problems and puzzles involving numbers or shapes.
- Investigate a general statement involving numbers or shapes.
- Solve one-step and two-step problems involving addition, subtraction, multiplication and division in the context of numbers or measurements, including money and time.



Mathematics: Year 5

I. NUMBERS AND THE NUMBER SYSTEM

A. WHOLE NUMBERS

- Read and write numbers to at least 1 000 000 in figures and words.
- Recognise and extend number sequences formed by counting on or back from any number in whole number or decimal steps of constant size, extending beyond zero when counting backwards.
- Identify Roman numerals from 1 to 100 (I – C).
- Recognise the place value of each digit in any number to at least 1 000 000, and partition such numbers.
- Round numbers to the nearest 10, 100 or 1000.
- Compare positive and/or negative integers using the $<$, $>$, and $=$ signs.
- Order a set of positive and/or negative integers and position them on a number line.

B. FRACTIONS

- Compare fractions with like or unlike denominators, using the signs $<$, $>$, and $=$.
- Order a set of fractions with like or unlike denominators and position them on a number line.
- Identify mixed numbers and improper fractions
- Convert improper fractions to mixed numbers and vice versa.
- Recognise and find equivalent fractions, e.g. $\frac{2}{3} = \frac{8}{12}$.
- Express a smaller number as a fraction of a larger number, e.g. 3 out of 4 as $\frac{3}{4}$.
- Add or subtract fractions with like denominators, converting totals that exceed 1 to a mixed number.
- Find fractions of numbers or quantities, e.g. $\frac{3}{4}$ of 12, $\frac{1}{100}$ of £8.

C. DECIMALS

- Explain what each digit represents in decimals with up to two decimal places, and partition such numbers.
- Compare decimals with up to two decimal places using the signs $<$, $>$, and $=$.
- Order a set of decimals with up to two decimal places and position them on a number line.
- Round a decimal with one decimal place to the nearest whole number, and a decimal with two decimal places to the nearest tenth and whole number.
- Relate fractions to their decimal representations, e.g. $0.45 = \frac{45}{100}$.

D. PERCENTAGES

- Recognise the per cent sign (%) and understand percentages as the number of parts in every 100.
- Express one half, one quarter, three quarters, tenths and hundredths as percentages and decimals:
 - e.g. $\frac{3}{4} = 0.75 = 75\%$, $\frac{4}{10} = 0.4 = 40\%$, $\frac{27}{100} = 0.27 = 27\%$.
- Find simple percentages of numbers or quantities, e.g. 10% of 60, 5% of £20.

II. NUMBER OPERATIONS AND CALCULATIONS

A. ADDITION AND SUBTRACTION

- Use the principles (but not the names) of the commutative and associative laws as they apply to addition.
- Use known number facts and place value mentally to:
 - find the difference between two near multiples of 100 or 1000, e.g. $809 - 496$, $3006 - 1993$;

- add or subtract a multiple of 100 to or from a three-digit or four-digit number, e.g. $458 + 500$, $1357 - 600$;
- add or subtract three-digit multiples of 10, e.g. $470 + 240$, $570 - 390$.
- Use efficient written methods to add and subtract whole numbers and decimals with up to two decimal places.

B. MULTIPLICATION AND DIVISION

- Use the principles (but not the names) of the commutative, associative and distributive laws as they apply to multiplication:
 - example of commutative law: $15 \times 33 = 33 \times 15$
 - example of associative law: $15 \times 33 = (5 \times 3) \times 33$ or $15 \times (3 \times 11) = 495$
 - example of distributive law: $34 \times 98 = 34 \times (100 - 2) = (34 \times 100) - (34 \times 2) = 3400 - 68 = 3332$
- Recall quickly multiplication facts up to 10×10 and the corresponding division facts.
- Recall square numbers and square roots, and recognise the notation for square (2) and square root ($\sqrt{\quad}$).
- Identify multiples, common multiples, factors and common factors.
- Know the meanings of prime number, prime factor and composite number.
- Use known number facts and place value to multiply pairs of multiples of 10 or 100, e.g. 50×30 .
- Multiply and divide whole numbers and decimals by 0, 1, 10, 100 or 1000, and understand the effect (including understanding that division by 0 is impossible).
- Use efficient written methods to:
 - multiply a three-digit or four-digit number by a one-digit number, e.g. 2814×7
 - multiply a two-digit or three-digit number by a two-digit number, e.g. 57×42
 - multiply decimals with one or two decimal places by a one-digit number, e.g. 8.3×7 , 15.6×8 , $\text{£}4.23 \times 6$
- Divide a two-digit or three-digit number by a one-digit number, including division with remainders, rounding up or down depending on the context, e.g. $574 \div 9$

C. MIXED OPERATIONS

- Use knowledge of rounding, number operations and inverse relationships to estimate and check calculations.
- Begin to use brackets to solve multi-step calculations.

III. MEASUREMENT

A. LENGTH, MASS, CAPACITY, VOLUME AND TEMPERATURE

- Estimate, measure and record lengths, masses, capacities and temperatures using standard units (km, m, cm, mm, kg, g, l, ml, °C) to a suitable degree of accuracy.
- Convert between different units of measure using decimals to one or two places, e.g. 3.25 litres = 3250 ml, or vice versa.
- Interpret a reading that lies between two unnumbered divisions on a scale.
- Understand basic equivalencies between metric and common imperial units still in everyday use.
- Know abbreviations for common imperial units.
- Recognise volume in practical contexts, for example using 1cm^3 blocks or interlocking cubes.

B. TIME

- Read the time on a 24-hour digital clock and use 24-hour clock notation, e.g. 17:42.
- Read a timetable using 24-hour clock notation.

C. MONEY

- Use all four operations to solve problems involving money.

D. PERIMETER AND AREA

- Measure and calculate the perimeter of regular polygons.
- Calculate the area of rectangles and related compound shapes using standard unit cm^2 or m^2 .
- Use the formula for the area of a rectangle.

IV. GEOMETRY**A. 2-D SHAPES AND 3-D SOLIDS**

- Identify, visualise and describe properties of triangles, quadrilaterals, regular polygons and 3-D solids.
- Use knowledge of properties to draw 2-D shapes and make nets of common 3-D solids such as a cube, cuboid, pyramid and triangular prism.
 - E.g. The drawing shows how the 3-D solid would look if opened out and unfolded into a flat shape.

B. POSITION, DIRECTION AND MOVEMENT

- Use coordinates in the first quadrant to read and plot specified points, and to draw sides to complete 2-D shapes.
- Draw the position of a shape after a translation.
- Identify, estimate and order acute and obtuse angles.
- Use a protractor to draw and measure angles.

C. SYMMETRY

- Complete symmetrical patterns with up to two lines of symmetry.
- Draw the reflection of a shape or pattern in a mirror line parallel to one side, where all sides of the shape or pattern are not parallel or perpendicular to the mirror line.

V. DATA

- Collect, process, represent, interpret and discuss data in a tally chart, frequency table, pictogram, bar chart or line graph.
- Read, interpret and represent data:
 - where symbols represent more than one unit, e.g. 2, 5, 10, 20 or 100
 - where scales have intervals of differing step size, e.g. axis labelled in 2s, 5s, 10s, 20s or 100s

VI. PROBLEM SOLVING AND REASONING

- Identify, describe and use numerical and symbolic patterns and relationships.
- Solve mathematical problems and puzzles involving numbers or shapes.
- Propose and investigate a general statement involving numbers or shapes.
- Solve one-step and two-step problems involving whole numbers and decimals, and all four operations, in the context of numbers or measurements, including money and time.



Mathematics: Year 6

I. NUMBERS AND THE NUMBER SYSTEM

A. WHOLE NUMBERS

- Read and write whole numbers in figures and words.
- Know what each digit represents in whole numbers and partition, compare, order and around these numbers.
- Recognise and extend number sequences formed by counting on or back from any number in whole number or decimal steps of constant size, extending beyond zero when counting backwards, e.g. a sequence of square or triangular numbers.
- Identify Roman numerals from 1 to 1000 (I – M), and recognise years written in Roman numerals.
- Find the difference between a positive and a negative integer, or two negative integers, in context such as the number line or temperature.

B. FRACTIONS

- Order a set of fractions by converting them to fractions with a common denominator.
- Convert improper fractions to mixed numbers and vice versa.
- Express a larger whole number as a fraction of a smaller one, e.g. $\frac{7}{3} = 2\frac{1}{3}$.
- Reduce a fraction to its simplest form by cancelling common factors.
- Determine the lowest common denominator (LCD) of fractions with unlike denominators.
- Add or subtract mixed numbers, e.g. $2\frac{3}{4} + 4\frac{5}{6}$.
- Add or subtract fractions with like or unlike denominators, e.g. $\frac{1}{5} + \frac{2}{5}$, $\frac{3}{4} - \frac{2}{3}$.
- Identify the reciprocal of a given fraction and know that the product of a given number and its reciprocal equals 1.
- Multiply simple unit fractions by fractions, e.g. $\frac{1}{4} \times \frac{2}{3}$, and multiply a pair of proper fractions, e.g. $\frac{3}{4} \times \frac{2}{3}$, expressing the answer in its simplest form.
- Divide proper fractions by whole numbers, e.g. $\frac{2}{3} \div 4$, expressing the answer in its simplest form.
- Use a fraction as an operator to find fractions of numbers or quantities, e.g. $\frac{5}{8}$ of 48, $\frac{7}{10}$ of £50.
- Associate a fraction with division to calculate a decimal fraction equivalent.

C. DECIMALS

- Explain what each digit represents in decimals with up to three decimal places, and partition such numbers.
- Compare decimals with up to three decimal places using the signs $<$, $>$, and $=$.
- Order a set of decimals with up to three decimal places and position them on a number line.
- Round decimals to the nearest whole number, tenth and hundredth.
- Relate fractions to their decimal representations, e.g. $0.45 = \frac{45}{100}$.

D. PERCENTAGES

- Recall, derive and use equivalences between fractions, decimals and percentages.
- Find percentages of whole numbers or quantities, e.g. 45% of 160, 15% of £70.

E. RATIO AND PROPORTION

- Use the vocabulary of ratio and proportion to describe the relationship between two quantities.
- Scale numbers or quantities up or down.

- Create simple scale drawings.
- Recognise equivalent ratios and reduce a given ratio to its simplest form.

II. NUMBER OPERATIONS AND CALCULATIONS

A. ADDITION AND SUBTRACTION

- Use the principles of the commutative and associative laws as they apply to addition.
- Use known number facts and place value to mentally add or subtract decimals, e.g. $3.6 + 8.7$, $9.4 - 5.8$.
- Use efficient written methods to add and subtract whole numbers and decimals.

B. MULTIPLICATION AND DIVISION

- Use the principles of the commutative, associative and distributive laws as they apply to multiplication:
 - example of commutative law: $8.4 \times 7 = 7 \times 8.4$
 - example of associative law: $16.8 \times 50 = 16.8 \times (10 \times 5)$ or $(16.8 \times 10) \times 5 = 168 \times 5 = 840$
 - example of distributive law: $7.6 \times 95 = 7.6 \times (100 - 5) = (7.6 \times 100) - (7.6 \times 5) = 760 - 38 = 722$
- Recall quickly multiplication facts up to 12×12 and the corresponding division facts.
- Recall square numbers to 12×12 , e.g. 12^2 , and the corresponding square roots, e.g. $\sqrt{144}$, and use known square numbers to derive squares of multiples of 10.
- Identify and use multiples, common multiples, lowest common multiples (LCM), factors, common factors and highest/greatest common factors (HCF/GCF).
- Know and use the meanings of prime number, prime factor and composite number.
- Use known number facts and place value to mentally multiply or divide decimals by a one-digit number, e.g. 5.8×6 , $8.6 \div 3$.
- Use efficient written methods to:
 - multiply a two-, three- or four-digit number by a two-digit number, e.g. 574×42 ;
 - multiply decimals with one or two decimal places by a one-digit or two-digit number, e.g. 6.8×12 , $\pounds 9.25 \times 8$;
 - divide a three-digit or four-digit number by a two-digit number, including division with remainders, rounding up or down depending on the context, e.g. $465 \div 16$;
 - divide decimals with one or two decimal places by a one-digit or two-digit number, e.g. $\pounds 14.65 \div 4$, $54.6 \div 12$.

C. MIXED OPERATIONS

- Use knowledge of rounding, number operations and inverse relationships to estimate and check calculations.
- Use brackets to solve multi-step calculations.

III. MEASUREMENT

A. LENGTH, MASS, CAPACITY, VOLUME AND TEMPERATURE

- Estimate, measure and record lengths, masses, capacities and temperatures using standard units (km, m, cm, mm, kg, g, l, ml, °C) to a suitable degree of accuracy.
- Convert between different units of measure using decimals to three places, e.g. $2.475 \text{ kg} = 2475 \text{ g}$, or vice versa.
- Read and interpret scales on a range of measuring instruments.
- Understand and use equivalencies between metric and common imperial units still in everyday use.
- Use the formula, and the standard units cm^3 and m^3 , to calculate the volume of cubes and cuboids.

B. TIME

- Read a timetable using 24-hour clock notation and calculate time intervals.

C. MONEY

- Use all four operations, fractions and percentages to solve problems involving money.

D. PERIMETER AND AREA

- Measure and calculate the perimeter of regular and irregular polygons.
- Use the formula, and a variety of standard units (mm^2 ; cm^2 ; m^2 ; km^2), to calculate the area of rectangles and related compound shapes.
- Use the formulae to calculate the area of triangles and parallelograms.
- Use the formulae to calculate the surface area of cubes and cuboids.

IV. GEOMETRY**A. 2-D SHAPES AND 3-D SOLIDS**

- Identify, visualise, describe and classify triangles, quadrilaterals, regular polygons and 3-D solids.
- Make and draw shapes with increasing accuracy and apply knowledge of their properties.
- Illustrate and name the parts of a circle including radius, diameter, circumference, arc and chord.

B. POSITION, DIRECTION AND MOVEMENT

- Use coordinates in all four quadrants to read and plot specified points.
- Draw the position of a shape after one or two translations on a coordinate plane.
- Estimate angles, and use a protractor to draw and measure angles with increasing accuracy.
- Calculate angles in a straight line, in a triangle, in a quadrilateral and around a point.

C. SYMMETRY

- Draw the reflection of a shape:
 - in a mirror line touching the shape at a point, where all sides of the shape are not necessarily parallel or perpendicular to the mirror line;
 - in two mirror lines at right angles, where the sides of the shape are parallel or perpendicular to the mirror line.
- Identify all the symmetries of 2-D shapes, cubes, cuboids and other common 3-D solids, including prisms.

V. DATA**A. DATA**

- Collect, process, represent, interpret and discuss data in a frequency table, bar chart (with grouped discrete data), line graph or pie chart.
- Find and interpret the mode, range, median and mean of a set of data.

B. PROBABILITY

- Use the language of probability to describe the chance or likelihood of particular events.
- Express the probability of a given event as a fraction or percentage, or on a probability scale from 0 to 1.

VI. PROBLEM SOLVING AND REASONING

- Represent and interpret numerical and symbolic patterns and relationships.
- Solve mathematical problems and puzzles involving numbers or shapes.
- Suggest and test hypotheses involving numbers or shapes.

- Solve multi-step problems involving whole numbers, decimals, fractions and percentages, in the context of numbers or measurements, including money and time.

VII. PRE-ALGEBRA

- Construct and use simple expressions and formulae expressed in words then symbols.
- Generate and describe linear number sequences.
- Recognise variables and solve basic equations using variables, e.g. What is $7 - c$ if c is 3.5?